MACHAKOS UNIVERSITY

University Examinations for 2016/2017 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARMENT OF BANKING, ACCOUNTING & FINANCE

THIRD YEAR FIRST SEMESTER EXAMINATION FOR BACHELOR OF COMMERCE

NBAC 309: FINANCIAL DERIVATIVES

DATE: 4/8/2017 **TIME: 2 HOURS**

INSTRUCTIONS:

Answer question ONE and Any other TWO questions.

QUESTION ONE (COMPULSORY) (30 MARKS)

a) Distinguish between Financial derivatives and commodity derivatives giving two examples of each. (4 marks)

b) Identify and explain five characteristics of forward contracts. (5 marks)

c) You have entered into a 10month forward contract on stock with a price of sh50.The risk free rate of interest (compounded continuously) is 8% P.a for all maturities. Dividends of shs 1.50 per share are expected after 3 months,6 months and 9months.

Required

i) Find the present value of the dividends (3 marks)

ii) Find the forward price F_0 (3 marks)

d) Malili Zilcom Ltd is a high technology company whose ordinary stock sells for shs 23 per share. A call option exists on this stock with 3 months to expiration. It has an exercise price of shs 18 and sells for shs 5.3.You have made a careful study of the stocks volatility and conclude that a standard deviation of 0.5 is appropriate for the next 3 months. Currently the annual rate of short term treasury bill is 6 %.

Required:

a) Using the Black-Scholes option pricing model determine whether the option is over-valued, under-valued or correctly valued. (9 marks)

b) Explain (but do not calculate) the effect of the following change on the value of Malilis option.

i) The length of time to expiration is one year instead of 3 months. (2 marks)

ii) The short term interest rate is 8% instead of 6 % (2 marks)

iii) The standard deviation 0.1 instead of 0.5. (2 marks)

QUESTION TWO (20 MARKS)

a) Explain the following terms as used in finance. (8 marks)

i) Call option

ii) Put option

iii) European option

iv) American option

b) i) Define the term 'intrinsic' value. (2 marks)

ii) A call option of XYZ Co. has an exercise price of shs 105.

iii) Find the intrinsic value of the call if the current price is

i) shs 100

ii) shs 105

iii) shs 115 (4 marks)

c) Suppose it was a put option and the facts remain as above, find its intrinsic value. (4 marks)

d) What do you understand by the term"put-call-parity theorem"? (2 marks)

QUESTION THREE (20 MARKS)

a) Differentiate between options and swaps (6 marks)

b) Ideal Tech Ltd has entered into a forward Rate Agreement that specified it will receive a fixed rate of 4% on a principal of shs, 1000,000 for a 3-month period starting in three years. If the 3-month floating rate is 4.5 % for the 3-month period, find the cash flow to the lender. (6 marks)

c) Explain four uses of financial derivatives (8 marks)

QUESTION FOUR (20 MARKS)

a) Explain the following terms as used in interest rate options. (6 marks)

i) Caps

ii) Floors

iii) Collars

b) Distinguish between the following terms

i) In– the- money and at the money

ii) Out -of- the money and Near the money (4 marks)

c) i) Explain the difference between long position and short position. (4 marks)

ii) Mapato Ltd took a long position on a 1 year futures contract on an investment asset that provides no income. The storage cost per unit for the asset is shs 20 and the payment is made at the end of the year. If the spot price of the asset is shs 4500 per unit and the risk free rate is 7% per unit for all maturities, calculate the theoretical futures prices F_O. (6 marks)

QUESTION FIVE (20 MARKS)

a) Name and explain four types of Greeks and indicate why a trader would result to their use. (6 marks)

b) Consider a 4 month put option on a stock index. The current value of the index is shs 305 and the strike price is shs300. The dividend yield is 3% p.a. The risk free interest rate is 8% p.a and the volatility of the index is 25% p.a.Find the gamma of the index. (6 marks)

c) Identify and explain four types of swaps. (8 marks)